

## Chapter 6

# Yard and Terminal Operations and Procedures

Railway cars normally spend over half of their useful life in yards and terminals. The major portion of battalion personnel and equipment are involved in yard and terminal operations. Efficient yard and terminal operations are required if the railway battalion is to exploit its maximum capabilities.

### RAIL YARDS

6-1. A rail yard is a system of tracks within defined limits used for making up and breaking up trains, storing cars, and allied purposes. Movements not authorized by timetable or train order may be made over these tracks. Yards may be located at railheads, depots, interchange points, ports, or terminals. Yards may also contain any number of tracks. The number and length of inbound and outbound trains determines the number and length of tracks. Railroad yards are natural bottlenecks in the movement of freight from one geographical area to another. In theory, cars may enter the receiving end of a yard as fast as they arrive. However, in practice, they can only depart as fast as the yard personnel can inspect, repair, classify and switch, and double them according to their setoff order. Depending on the density of traffic, the number of rail lines, and the geographical location, a yard may be one of two types: a progressive or a combination. Each of these types has certain characteristics and facilities that distinguish it and determine its operation. A typical civilian yard is shown in Figure 6-1.

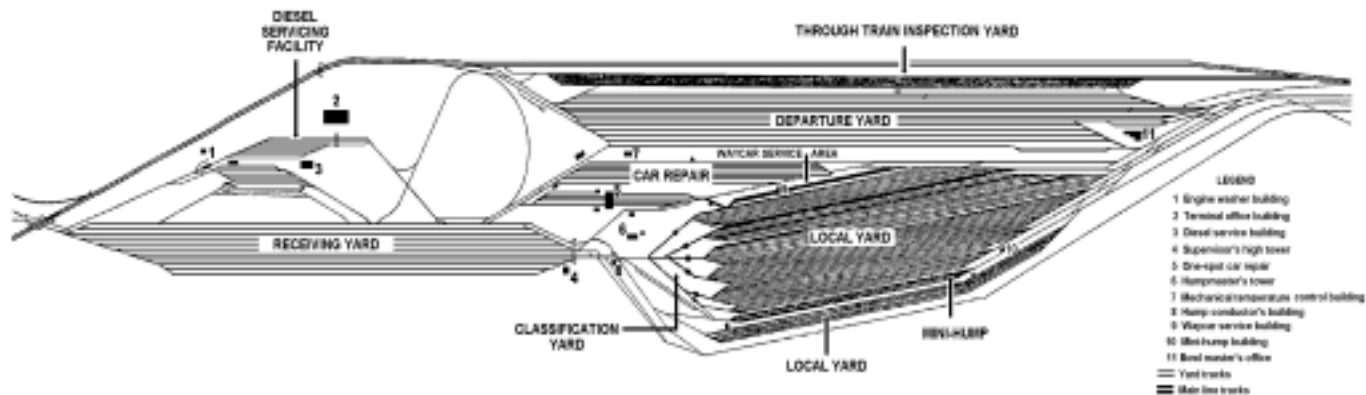
### PROGRESSIVE YARD

6-2. A progressive yard is located at busy terminals and has tracks running east and west. A progressive yard is subdivided into receiving, classification, and departure yards. Cars move through each of these subyards in a progressive manner.

#### Receiving Yard

6-3. The purpose of the receiving yard or tracks is to clear trains promptly on arrival to prevent main line congestion. As a train approaches the terminal area, it enters the yard by a lead track and clears the main line so that other traffic is not tied up. The road locomotive is uncoupled and goes to the enginehouse for inspection and repair. At this point, the train loses its identity and becomes a draft of cars. A yard clerk collects the freight waybills and makes a track check from which a switch list is prepared. On the track check, he records the initials, numbers, seal numbers, and kinds of cars in the order they stand (from front to rear) and shows whether the cars are loaded or empty.

Figure 6-1. Typical Civilian Yard  
(Santa Fe Southern Pacific Corporation - Barstow Yard)



#### HOW BARSTOW WORKS

Barstow Yard covers about 600 acres, has about 113 miles of track, 320 switches, 294,000 cross ties, 600,000 cubic yards of ballast, and can classify more than 2,700 cars daily at peak capacity. It was designed to provide flexible classification track assignments that will allow handling over 75 blocks going in three directions. Eighteen months in the design stage and 25 months under construction, the yard uses the most modern proven components available stressing operational reliability and safety. It can be divided into 9 areas for explanation purposes.

#### DIESEL SERVICING FACILITY

Inbound road engines move from the receiving yard to one of the pit tracks, where they are sanded, fueled, and serviced up through semi-monthly requirements. The consist then moves through the engine washer to the ready tracks where any unit needing shop work is cut out for movement to the major diesel shops on the east side of Barstow. Crews going on duty pick up their power in the ready yard and move to the departure yard to pick up a train.

#### RECEIVING YARD

Trains may arrive simultaneously in the receiving yard from three directions without disrupting humping operations. Trains from Northern California pass under the main lines to avoid conflict, trains from Southern California enter via a separate lead track, and trains from the East enter at the hump end with alternate leads, depending upon activity in the hump area. There are 10 receiving tracks on 22 foot centers, ranging in length from 6,900 to 8,080 feet with a capacity of about 1,420 cars.

#### WAYCAR SERVICE AREA

Waycars are switched into the north classification track, then to the service area by cable progression system. In the service area they are cleaned, washed, and necessary maintenance is performed. Waycars requiring heavy maintenance are switched to detention tracks while serviced waycars move to the east end of the yard and are placed on ready track for use on trains as required.

#### CLASSIFICATION YARD

There are 48 tracks in the classification yard, with a capacity of over 2,000 cars. Of these, 44 are main hump tracks and four are designated as "mini-hump" or "rehump" tracks. After trains in the receiving yard have been mechanically inspected, and waybills and diversions have been worked by the bill office, they are then moved via switch engine toward the crest of the classification yard. Computers at the hump (3 on line, 1 back-up) already have information on identification and destination for each car on the train. As cars are individually uncoupled at the crest, a series of computer controlled switches and braking devices come into play, aided by input from radar, wheel detectors, a weight-in-motion scale and other devices, resulting in each car being guided to its proper track at a speed that will ensure safe coupling. Three set-out tracks have been provided at the crest of the hump to accommodate and isolate cars loaded with dangerous commodities that should not be uncoupled while in motion.

#### CAR REPAIR

Wide track centers in the receiving yard, together with planned radio communications, provide capability for making minor repairs to cars from a truck operating in the receiving and departure yards. Those cars identified as bad order requiring repairs that cannot be made in either the receiving or departure yards, are humped into the assigned classification tracks, then switched to repair facilities. A three-track, one-spot repair facility capable of repairing 90 cars per day on a 3-shift basis is the center of activities. There are 10 other tracks in the car repair area capable of handling 270 cars per day designated for such things as heavy repairs, conditioning and classifying cars, preparing MLC cars, re-positioning loads that have shifted en route, unloading wheels and other material, and transferring load from cars needing further repair to serviceable cars.

#### LOCAL YARD

There are five tracks in the local yard from 2,700 to 3,300 feet long, with a capacity of about 300 cars. This yard serves as a "back-up" hold yard and, if needed, is on line and grade suitable for conversion to classification tracks in the future.

#### THROUGH TRAIN INSPECTION YARD

Three tracks adjacent to the main lines are used for through trains that are not classified at Barstow. The 22-foot track centers allow maintenance personnel to use mobile equipment for inspection and servicing. Track arrangement allows multiple use of these tracks which permits two or more trains to enter and depart at the same time.

#### DEPARTURE YARD

After cars are classified into blocks, two trim engines can work simultaneously, moving blocks to one of nine tracks in the departure yard which has a capacity of about 1,370 cars. Tracks are on 22-foot centers, allowing easy access for mechanical inspection and servicing. Auxiliary air, from ground outlets, provides for full servicing of trains before locomotive arrival. Three departures may be conducted simultaneously—one to Northern California, one to Southern California, and one eastbound—at the same time three trains may be arriving in the receiving track area.

#### MINI-HUMP

6-4. After removing the locomotive, car inspectors place a blue safety flag or marker at each end of the draft of cars and makes a thorough inspection of each car. Inspections include complete checks of the following:

- Brake system and rigging.
- Journal boxes (including journals, packing, and lubrication).
- Wheels and axles.
- Couplers, draft gear, and underframe.
- General state of the car body and its load.

Car inspectors should start at both ends of the draft of cars and walk along each side while making the inspection. In some yards, a pit may be dug beneath the tracks. While in the pit, an inspector can observe the underside of a car and its wheels and axles. When a defective car is found that cannot be immediately repaired in the receiving yard, a bad-order car is prepared with defects noted and attached to the car. The car is then placed on a bad-order track to await movement to the repair tracks. When the inspectors complete their work, the blue safety flag or marker is removed and the draft of cars is ready for switching to the classification yard.

#### **Classification Yard**

6-5. The classification yard is next to the receiving yard. In the classification yard, cars are sorted or classified according to destination and priority of movement. The destination may be to a local depot or supply point, a branch or connecting line points farther up the line, or a neighboring station or local industry. In classifying by destination, the yardmaster designates by number, the tracks in the classification yard to be used for the cars for each destination. If there are a large number of cars for a particular station, tracks may be designated by station. For example, cars are blocked consecutively in the draft so that the first cars to be set out en route are directly behind the locomotive. This prevents delay when the blocks of cars are set out along the line. Individual cars or groups of cars are switched to the various tracks according to a switching list that specifies the track number for each car.

6-6. When an artificial hill is built in the classification yard, the entire yard is called a hump yard. In hump switching, a switch engine pushes a draft of cars from the receiving yard up the hill or hump. At the crest of the hump, they are individually cut off and permitted to roll by gravity down the hump to the designated classification track. The conductor or brakeman positioned on the hump cuts off the cars in switch-list sequence as they go over the crest. Control of the car speed is either by handbrakes operated by brakemen riding the cars or by retarders controlled by a tower operator. The advantage of hump switching is the quick and efficient way in which cars can be switched and classified with a minimum use of active power. Hump switching is much faster than flat-yard switching because the movement is in a forward direction only and does not involve the back-and-forth movements of the locomotives. An entire train can be switched at one time, the train length being limited only by the pushing power of the switching locomotive. However, hump yards are expensive to build and are usually used only in large progressive yards where there is enough traffic to justify their expense.

#### **Departure Yard**

6-7. Once cars are classified, they are switched to the departure yard to be made up into trains. The cars are grouped from front to rear in the order in which they will be set off en route or in the order that will make switching easier at the next terminal. After a train is assembled, the train consist is repaired and sent to the yard office. Car inspectors make the departure or terminal airbrake test and another general inspection. While they are checking the cars, the road engine crew switches the engine from the engine ready track to the front end of the draft of cars. The train conductor must get the waybills and the train consists from the yard office and train orders and Clearance Form "A" from the train order office. Train orders give the priority of movement on the main line and the Clearance Form "A" gives the exact time the train is authorized to occupy the main line. When the brake tests are completed and the inspectors are satisfied that the equipment is in good shape and ready to operate, markers are placed on the rear of the last car and the draft of cars officially become a train. The train may leave the yard when the chief dispatcher gives the signal.

## COMBINATION YARD

6-8. Railroads frequently incorporate the receiving, classifying, and departure facilities into one yard. This may result from insufficient volume of work to justify three separate yards or from a lack of land to expand the yard layout. In combination yards, the number of tracks depends on the volume of traffic. The established length of inbound and outbound trains determines the track length. These yards are generally flat. Switching is accomplished by the back-and-forth movement of a yard engine with cuts of cars. Since this method prevails in most small yards, flat-yard switching is generally done in combination yards. In a combination yard, it is impossible to arbitrarily assign specific tracks for receiving only. Road trains must be taken into the yard without delay to prevent blocking the main track. The yardmaster decides which track to use. However, in a crowded yard, the yardmaster may be forced to accept a train on any track that is able to accommodate it. It may be necessary to use two tracks if the clear tracks are too short to accommodate the entire train. The longer tracks shown at A, Figure 6-2, are used interchangeably for inbound and outbound trains and the remaining tracks are used for classification.

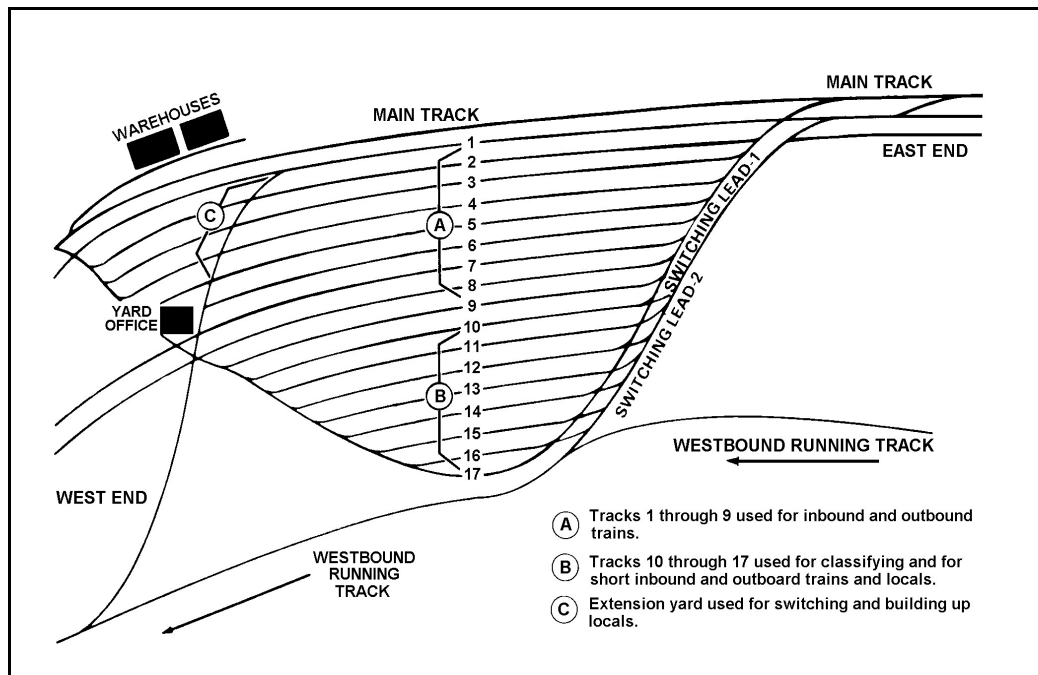


Figure 6-2. Typical Combination Yard

## TERMINAL FACILITIES

6-9. A railway terminal is a large installation at the beginning and end of a rail line for delivering and receiving freight or loading and unloading passengers. In a theater of operations, a military rail line will generally have a terminal at the beginning of the line but more often than not the forward end of the line will end at a railhead. Adequate terminal facilities are of vital importance in railway operations. Congestion can occur if facilities are not properly used or if they do not exist. The following can result if congestion occurs:

- Cars cannot be moved.
- Cars cannot be promptly loaded and/or unloaded.
- Tactical forces may be deprived of urgently needed supplies.

## SERVICE FACILITIES

6-10. Every railway terminal includes one or more of the types of yards discussed above plus other installations which may include inspection and repair tracks; locomotive ready tracks; fuel, sand, and water service facilities; ash pits; scale tracks; and so forth. Buildings within the terminal include the following:

- Sand houses and supplies which are located near service tracks.
- Shop buildings at the repair tracks.
- Yard offices and towers near the center of the yard for the control of classification and switching operations.
- Other buildings that provide billet and mess facilities for train crews.

Consider the protection afforded by each building against NBC attack when selecting each site. Certain types of buildings offer excellent shelter from nuclear hazards and require a minimum of time and effort to adapt for use. The stronger the structure, the better the protection against blast effects. An overpressure system, such as the SCPE, can be used to convert existing structures to provide rest and relief for personnel from NBC hazards. The SCPE is a field expedient system. Gas and particulate filters remove any NBC contamination from the air. The overpressure system stops leakage of contaminated air into the enclosure. Personnel enter and leave through a protective entrance. This entrance is an air lock; it prevents contamination from entering the enclosure. FM 3-4 provides more information on the other types of systems and their uses.

## **FREIGHT STATIONS**

6-11. Freight stations are named buildings, sheds, or warehouses. These stations provide facilities for the receipt, loading, unloading, or storage of equipment and supplies. Loading and unloading areas preferably have separate routes for vehicles to enter and depart. End ramps are provided for wheeled and tracked vehicles. When not available and when time does not permit the construction of end ramps, vehicles and tanks may be loaded on flatcars using field expedients discussed and shown in C4, TM 55-2200-001-12. The named freight station and consignees should be clearly shown on waybills or other documentation to permit prompt placement of cars by yard operating personnel.

## **PASSENGER STATIONS**

6-12. Facilities for moving personnel by rail should include one or more tracks on which cars can be placed before boarding time. Where facilities allow, cars used for the movement of troops should be cleaned, inspected, and watered before being placed for loading. When cars are equipped for steam heat, they should be heated (during cold weather) before troops board by using a station line, heater cars, or locomotive. Space, free of vehicular traffic, should be available adjacent to the loading track. This will allow personnel to assemble according to plan and permit ready handling of baggage and equipment. Station facilities should include office space for field transportation officers and battalion operating personnel, waiting rooms, storage sheds, car cleaning and watering tracks, and so forth.

## **ENGINEHOUSES**

6-13. Enginehouses (roundhouses) are quite vulnerable to air attack because they, with the usually adjacent turntable, are easily identified from the air. Where enginehouses are not available or are not usable for tactical reasons, tracks adjacent to the yard should be constructed or set aside for servicing locomotives. Such facilities should include fuel and water supplies, a pit for inspection and minor underneath repairs, ash pits for cleaning fires if steam locomotives are used, and a Wye track for turning locomotives in the absence of a turntable. Any new enginehouse constructed should be a simple, rectangular, functional, shed-like structure. If necessary, store needed equipment and tools in boxcars. A mobile workshop, operating from a mobile machine shop car, may be used at outlying points where no facilities exist and new construction is not feasible or justified. Personnel of the transportation railway equipment maintenance company operate the enginehouses.

## **TRACKS AND YARD CHARACTERISTICS**

6-14. To expedite yard work, certain tracks are necessary. These include main tracks outside the yard tracks, divided leads, running tracks, switching leads, sufficient track length, and so forth.

**OUTSIDE MAIN TRACKS**

6-15. When main tracks are outside the yard tracks, time may be saved in switching cars. When a main track separates a main yard from an auxiliary yard, crews are delayed in crossing from one yard to another. Yardmasters have no control over the main tracks, and crews must obtain the dispatcher's permission before crossing the tracks. For example, a yard crew of 30 or 40 cars crossing the main track will interrupt the entire switching operation for 15 to 30 minutes depending on main line traffic. An ideal arrangement is to have the main tracks located several kilometers from yards or yard tracks. A main track with a low train density may not restrict yard work significantly. One with a high density of traffic may deal with yard operations to the extent that it might be advantageous to relocate the main track.

**DIVIDED LEADS**

6-16. Divided leads may be located at each end of a yard. This enables two yard crews to work at the same time. Where only a single lead exists and two crews are employed, one crew must generally couple cars and make room on tracks while the other uses the lead in switching cars.

**RUNNING TRACKS**

6-17. Running tracks extend the entire length of the yard and provide a route of travel to any point in the yard independent of the switching leads and classification tracks. When two running tracks exist, they are assigned directional designations. Most railroads permit road and yard crews to use these tracks without prior permission from the yardmaster. However, their movement must be in the direction specified by the track designator. With the exception of yard facility tracks, running tracks are generally the only ones that may be used without permission.

**LONG LEADS AND APPROACHES**

6-18. Switching leads provides access to any point within a yard. They must be long enough to handle the longest length of cars normally handled. They must also lead out of the yard to running tracks or to the main line. Long approaches to the switching leads are desirable so that yard crews can move long cuts of cars from one track to another.



## **TRACK LENGTH**

6-19. Tracks should be long enough to handle inbound and outbound trains without doubling or moving cars off one track and coupling to cars on another. For example, if a 100-car train enters a yard on a track that can hold only 65 cars, the train must double 35 cars to another track and block the lead while making the double. When an outbound train is built up on two or more tracks of limited length, delay will occur in doubling the train. When the train is on one track, the air test, which must be made only after the train is complete, can be made before the train moves out to block the lead. Pusher engines may be used to help reduce the delay by pushing the train out of the yard.

## **OTHER TRACKAGE AND YARD FACILITIES**

6-20. Ready tracks are located near enginehouses and are used when moving locomotives waiting to go on the road. When a locomotive is ready for road or switching service, it is moved to the ready track. When the locomotive is needed, it is moved through the lead track to the front of the assembled train. Facilities to inspect, water, fuel, and sand locomotives are located alongside the ready track.

6-21. Repair tracks (rip tracks) are located in the receiving yard. They are used during inspection to repair cars with mechanical defects. Light and heavy repairs are made to cars in a large rail yard and therefore require both light and heavy repair tracks. If the volume of traffic is great, rebuilt facilities may be required. In any small yard, there will always be light repair tracks. Mechanically defective cars are switched from trains and placed on bad-order tracks leading to the repair tracks. If extensive repairs are required on a loaded car, transfer tracks are used to transfer the freight from the defective car to another car to prevent long delays. If perishables are being handled, facilities for re-icing cars or servicing mechanical refrigerator cars are required.

6-22. Inspection tracks are used to inspect locomotives and cars. The tracks may be equipped with a pit and floodlight so the inspector can examine the underframe of cars, trucks, and locomotive running gear.

6-23. Team tracks or spurs provide a place for loading and unloading railcars and must be accessible to motor vehicles. They are frequently near ramps to allow for easier loading and unloading of vehicles on flatcars for piggyback movement. Shippers provide their own vehicles for loading and unloading cars on team tracks.

6-24. Dangerous commodity tracks are provided for handling ammunition, explosives, and POL products. These tracks are isolated from other tracks in the yard. Other tracks may be identified for the deliberate decontamination of locomotives and railcars.

6-25. Miscellaneous tracks include special tracks such as wreck train and work train equipment tracks and storage tracks for cars loaded with sand, gravel, rails, crossties, and other maintenance of way materials. They are functionally located within the yard and are readily accessible when cars are switched out and placed in trains. If a railroad handles livestock and perishable freight, it must have facilities for feeding, watering, and resting livestock, and for re-icing refrigerator cars containing perishable shipments.

6-26. The enginehouse contains repair equipment, materials, and tools used to inspect, service, and make running repairs on locomotives that operate on the railway division. The railway equipment company operates the enginehouse. When inspections, services, and repairs are finished, the locomotives are ready for road or yard service.

## **YARD PERSONNEL DUTIES AND RESPONSIBILITIES**

6-27. The operation of a yard at a rail terminal requires a large number of workers assigned to a variety of duties. The following describes the duties of the yardmaster, yard clerks, yard switch crews, and car inspectors.

### **YARDMASTER**

6-28. The yard office is the workshop from which the yardmaster supervises and coordinates all yard and clerical work. The yardmaster is in complete charge of all workers and all activities within the yard. He is responsible for safely, speedily, and economically switching inbound trains and building up and forwarding outbound trains. These duties include distributing cars in the yard, assigning tracks for loading and unloading cars, assigning work to switching crews, and calling train crews. The clerical work in yard operation is also the yardmaster's responsibility. This work consists of the following:

- Making track checks.
- Notifying local consignees of cars arriving for them.
- Maintaining car record books.
- Compiling train consists.
- Sorting and distributing waybills.
- Preparing any other documentation necessary for dispatching trains from the yard to their destination.

The yardmaster is also responsible for the following records and reports.

#### **Yardmaster's Journal**

6-29. When planning the switching of trains, the yardmaster must consider freight on hand. When a yardmaster reports for duty, he should check the lineup of incoming trains and the cars already in the yard. He should immediately begin to plan the make up of trains to clear the yard for inbound trains. The check is made using the yardmaster's journal.

6-30. The yardmaster's journal, sometimes called a "turn-over book," provides information needed in planning the switching and make up of trains. It is an up-to-date, permanent record maintained by each yardmaster on each shift. It is used to inform each yardmaster of the status of every track in the yard. Figure 6-3 shows a sample page from the journal that might be kept for the combination yard. The actual form may vary among railroads but information found on journals are basically the same. In a theater of operations, journals are kept as simple as possible and show only essential information. In addition to the name of the yardmaster, the terminal or yard name, the date, and the time, the journal may also show the following:

- A consist or lineup of inbound trains due in the next several hours. If there is no figure for the estimated time of arrival, the dispatcher will estimate the arrival time later.
- The listing of every track in the yard including cars and their contents.
- The status of every track in the yard to include whether the cars are coupled, whether they are at the east or west end, or whether the cars on the shop tracks are spaced or unspaced. An appropriate notation is also made if the air has been tested and okayed on any track.
- A list of the yard crews and locomotives that will be working during the oncoming shift, exactly what each crew is doing at the time of the yardmaster's change, and where each engine is awaiting relief. Yardmasters usually change shifts a half or full hour before yard crews change.
- A list and consist of trains ready for departure.

Yardmasters	<u>West</u> Yard	Date <u>1 Jun 98</u>
<u>Lewis</u>	CONROY	Time <u>2300</u>
(name)		
Inbound Line-Up		
Engine	Conductor	Cars
3076	Brown	76 (to switch)
3220	Bristol	125 (60 north route) (50 south route)
194	Dands	115 (15 miscellaneous to switch)
ETA		
		2330
		0200
		N.F.
Track		
Situation		
1.	Clear	
2.	Clear	
3.	Clear	
4.	Clear	
5.	Engine 3076 ordered in -- 76 to switch	
6.	30 SW (east end)	
7.	100 empty 70-ton hoppers (air OK)	
8.	Clear	
9.	85 EV (coupled; at west end)	
10.	10 BR (coupled)	
11.	9 MS	
12.	Clear	
13.	12 AY	
14.	27 Elwood locals	
15.	12 Red River	
16.	14 GP-12 SW (mixed)	
17.	12 Hold & Miscellaneous	
Extension Yard		
Shop Tracks		
1.	Clear	1. 25 shops (spaced)
2.	Clear	2. 18 shops (spaced)
3.	Clear	3. 17 shops (unspaced)
4.	Clear	shop lead -- clear
5.	10 co. coal	
Regular Crews		
Extra Crews		
Eng. 9332 Comdr. Frank		Eng. 9552 Comdr. Jones
(coupling #9 at west end)		(at switch tenders; due off duty at 2330).
Eng. 9332 Comdr. Williams		Extra crew due off dock at 0001.
(spacing #3 shop track)		Will call for instructions.
Watch for and expedite these cars: MSJ 19086; PRR 425003; EdL 19522. Car distributor promises to take the 100 mty hoppers about 0700.		

Figure 6-3. Sample Page of Yardmaster's Journal

- Other data pertinent to yard operations. The journal pages have wide margins to allow for additional entries as work progresses. After 2300 hours, all cars switched to the tracks from the west end of the yard will be entered on the right side. Figure 6-4 shows a sample of a journal page with all entries posted. These entries should be consulted and checked after the switching operation is completed.

5.	Clear
6.	9 SV+9+6+30 SW (east end) + 1 SW + 1 SW
7.	100 mty 70-ton hoppers (air OK)
8.	Clear
9.	2A4+4+1+85 EV (coupled; west end) + 2 EV + 3 MO + 2 BR
10.	1 + 1- BR (coupled)
11.	1 + 9 MO
12.	Clear
13.	12 A4 + 4 ELI + 10 CY + 2 CY + 5 SW
14.	2 BP + 1 WD + 2 BP + 27 Elwood locals + 3LY
15.	12 Red River
16.	1 CP + 1 CP + 20W + 14 CP + 12 OW (mixed)
17.	1 Shop + 12 Hold & Miscellaneous
<div style="display: flex; justify-content: space-between;"> <span>Extension Yard</span> <span>Shop Tracks</span> </div>	
1.	1.

**Figure 6-4. Part of Journal Page After Switching**

#### **Car Inspector's Train Report (DA Form 5616-R)**

6-31. Prepare this report for each train that is inspected when it enters or leaves a yard or terminal (Figure 6-5). A blank DA Form 5616-R is in Appendix A. You may reproduce this form on 8 1/2 x 11-inch paper. Indicate the train number, engine number, station, and date at the top of the form. Show the date, brake pipe leakage, and time of air test in the proper blocks. Indicate the percent of brake pipe leakage. A "Remarks" block is provided for any other additional information. All other blocks are self explanatory.

CAR INSPECTOR'S TRAIN REPORT				ENGINE NUMBER	STATION	DATE
For use of this form, see FM 55-20. The proponent agency is TRADOC.				3076	HARBOR YARD	1 AUG '98
INBOUND		OUTBOUND				
TIME OF ARRIVAL	TIME INSPECTION BEGAN	TIME OF DEPARTURE	TIME INSPECTION BEGAN			
2330	0030	1815	1530			
NUMBER OF CARS	CABOOSE NUMBER	NUMBER OF CARS	CABOOSE NUMBER			
16	8474	30	8301			
BLUE FLAG DISPLAYED	BLUE FLAG REMOVED	BLUE FLAG DISPLAYED	BLUE FLAG REMOVED			
0015	0315	1515	1635			
NUMBER OF CARS BAD ORDER	TIME INSPECTION COMPLETED	AIR TEST	BRAKE PIPE LEAKAGE			
0	0300	1620	2 1/2			
REMARKS	TIME INSPECTION COMPLETED					
NONE	1630					
REMARKS		REMARKS				
NONE		NONE				
SIGNATURE OF INSPECTOR		SIGNATURE OF INSPECTOR				
R.A. Ferson		C.A. McNeill				

DA FORM 5616-R, DEC 86

Figure 6-5. Sample DA Form 5616-R

**Daily Statement of Cars On Hand (DA Form 5617-R)**

6-32. Station agents and yard clerks prepare this report using information obtained from the car-record book and/or from a physical check of the cars on hand in the yard or station sidings (Figure 6-6). A blank DA Form 5617-R is in Appendix A. You may reproduce this form on 8 1/2 x 11-inch paper. This form shows the car number, date received, type of contents, consignee, and length of and reason for any delay. The report is forwarded daily through channels to the battalion commander (division superintendent) for his information and his reports to higher authority.

**YARD CLERKS**

6-33. Yard clerks prepare train consists, switch lists, and do other administrative jobs assigned by the yardmaster. They also make yard checks, maintain an exact up-to-the-minute location of all cars, and check car numbers of all arriving and departing trains. The number of yard clerks required depends on the type and volume of work to be done. Three clerks are usually required on each shift. One clerk handles the inbound clerical work, one does all outbound clerical tasks, and the third is assigned to checking cars. When there is a large number of tracks, two or more clerks may be required to check cars. Clerical duties may vary considerably among railroads in different localities.

**Inbound Clerical Work**

6-34. During inbound clerical work, the initials and numbers of all cars arriving in the yard must be entered in the car record book. The inbound clerk checks the waybills against the completed track check and makes sure that the numbers on the track check agree with those on the waybills. They must also make sure that there is a car for every waybill and vice versa.

6-35. Many other reports are often necessary. These include arrival notices to local consignees, hold notices, reweigh reports (necessary when bulk-loaded cars have lost part of their lading), and seal reports. All yards stamp each waybill on the back with a junction stamp showing the time and date of arrival and the name of the yard. Clerks are then able to check the time interval of cars in and between various yards. These notations also enable yardmasters to inquire or start corrective actions concerning cars that are subjected to unreasonable layovers between point of origin and destination. Most yards maintain an inbound and outbound train sheet that shows the engine number, conductor's name, arrival or departure time, and the number of loads and empties in each train or drag. A drag is generally a long, slow freight train handled by a yard engine on a main track. The train sheet is usually maintained from 0001 through 2350 hours.

**6-15**



**Outbound Clerical Work**

6-36. When an outbound train has been called, the clerk assigned the outbound duties computes the gross tonnage. The following forms help the clerk to keep an accurate account of all trains and freight leaving the yard.

6-37. **Train Consist.** A train consist is prepared by showing a list of the cars which make up a train. The report shows the initials, number, contents, weight, origin, and destination of each car in the order (from front to rear) in which the car stands in the train. Immediately after a train is dispatched, the train consist is sent by telephone or teletype to the yard at the train's destination. No standardized form is prescribed for the train consist. Four copies of the train consist are required for distribution. Distribute the consist as follows:

- Original is sent to the car records office for posting and filing.
- A copy goes to the transportation movements officer at point of origin.
- A copy is kept by the yardmaster at train origin.
- A copy goes to the yardmaster at train destination.

The yardmaster uses it to plan his switching operations and track allocations. The train consist is also placed in permanent files for use in financial accounting.

6-38. **Commercial Freight Waybill.** A commercial freight waybill authorizes a common commercial carrier to move a railway car. The shipper prepares a waybill. The commercial freight waybill shows the following:

- Car number and initials.
- Contents.
- Weight.
- Consignor.
- Consignee.
- Origin.
- Destination.
- Date of issue.
- Number of seals used (if any).
- Any special instructions or information required for the movement.

This information is used to trace the shipment if it is lost, stolen, or damaged while en route. Similar systems may be used in overseas areas where the HN railroad is used.

Note: A home route card will be used and attached inside the waybill when the railcar is to be returned to the origin point. This would normally be used for special type cars to handle specialized cargo.

**6-39. Transportation Control and Movement Document.** Where military standard transportation and movement procedures are prescribed, all documentation must be according to MILSTAMP directives in DOD Regulation 4500.32-R, Volume 2. The TCMD is used for all shipments from military activities and may be used as a freight waybill. The number of any seals used, routing, and any special instructions are inserted on the form.

**6-40. Track Check.** The outside clerk ensures that information on the track check corresponds to the waybill and that the train is in station order. The clerk formats the track check and must show the initials, number, contents, and type of each car (box, tank, hopper, or flat). He also records the seal number of each car, applies new seals when necessary, and makes a record of the seals used. No seal numbers are shown in the sample format (Figure 6-7, page 6-18) because the cars are empty. If seals were required, an additional column would be added and the seal numbers recorded. The clerk indicates at the top of each sheet at which end of the train the check was started.

**6-41. Switch List.** The switch list can be prepared using the same format used for the track check (except a column for destination and track are added). The clerk prepares the switch list using information on the track check. In turn, the switch list shows the destination of each car, whether it is empty or loaded, the track to which a car must be switched, and the number and size of the cuts to be made in breaking up the train. Figure 6-8, page 6-19, shows a track check converted to a switch list.

## YARD SWITCHING CREW

**6-42.** A yard crew is generally composed of four members: the engineer, the conductor, and two brakemen. The brakemen may also be called switchmen. The brakeman working farthest rearward from the engine is known as the rear brakeman. If workload requires, additional brakemen may be assigned. Where a long lead with a large number of switches exists, an extra brakeman or a switchtender may also be assigned. The yard conductor, sometimes called the switch foreman, is in complete charge of the crew and is responsible for carrying out the yardmaster's instructions in a safe and expeditious manner. The yardmaster usually delivers instructions in writing if verbal instructions are complicated or would be confusing. The conductor must fully inform his crew what to do and how to do it. The yard conductor normally uses a switch list. The switch list will be developed from information obtained from the track check.

No. of car	West End #5 1st					No. of car	West End #5 2nd				
	Initial	Number	L - Loaded E - Empty	Type			Initial	Number	L - Loaded E - Empty	Type	
1	PRR	675699	L	H		1	C&O	29280	L	H	
2	"	686353	"	"		2	WP	2386		G	
3	EROX	2601	E	R		3	NP	51320		"	
4	"	2632	"	"		4	GTW	106504		H	
5	C&D	22432	L	H		5	"	106599			
6		22567				6	ATSP	181075			
7		29200				7		181350			
8		29257				8		181099			
9	USAX	11214		T		9		86420			
10	B & O	241254		G		10		86791			
11	"	240401				11	GN	86210			
12	"	240422				12		86340			
13	ERIE	8702		F		13		86980			
14		8799				14		74657		G	
15		7221				15		77200			
16		23589		H		16		77229			
17	USAX	11218	E	T		17	TH&B	1102		H	
18	"	11149				18	PMCKY	63101			
19	"	11212				19	"	64209			
20	MC	11508	L	H		20	NKP	25003	E	B	
21		11513				21	WLE	30143	"	"	
22		11530				22	CBQ	72055	L	G	
23		12101				23	"	72129			
24		12113				24	"	72150			
25		12767				25	RDG	4562		F	
26	CP	139411	E	B		26	BLE	65775		H	
27	O&W	676		"		27	SAL	36525			
28	MDT	19495		R		28	SOV	107678			
29	NVC	431101	L	H		29	DLW	81640			
30		431767				30	"	82291			
31		434567				31	"	85494			
32		432106				32	LV	16525			
33	PLE	66701				33	VTX	22276	E	T	
34	"	66125				34	USAX	25445	E	B	
35	C&O	29210				35	"	25560			
36	T&P	5120	E	F		36	"	25638			
37	KCS	29104	L	H		37					
38	MKT	40686				38					
39	SLSF	87440				39					
40	"	88202				40					

Legend:  
 B - Boxcar      H - Hopper      R - Refrigerator  
 T - Tank car    F - Flat            G - Gondola

Figure 6-7. Sample Format of a Track Check for Inbound Train

No. of car	West End #5 1st					Track		No. of car	West End #5 2nd					Track	
	Initial	Number	L - Loaded E - Empty	Type	Destination				Initial	Number	L - Loaded E - Empty	Type	Destination		
1	PRR	675699	L	H	BO	14		1	C&O	29280	L	H	DW	6	
2	"	686353	"	"	-	-		2	WP	2386		G	-	-	
3	EROX	2601	E	R	AY	9		3	NP	51320		"	-	-	
4	"	2632	"	"	-	-		4	GTW	106504		H	CY	13	
5	C&D	22432	L	H	EV	-		5	"	106599			-	-	
6		22567			-	-		6	ATSF	181075			SV	-	
7		29200			-	-		7		181350			-	-	
8		29257			-	-		8		181099			-	-	
9	USAX	11214		T	CP	16		9		86420			-	-	
10	B & O	241254		G	BR	10		10		86791			-	-	
11	"	240401			WD	14		11	GN	86210			DW	6	
12	"	240422			MO	11		12		86340			EV	9	
13	ERIE	8702		F	SV	5		13		86980			-	-	
14		8799			-	-		14		74657		G	LY	14	
15		7221			-	-		15		77200			-	-	
16		23589		H	SHOP	17		16		77229			-	-	
17	USAX	11218	E	T	BO	14		17	TH&B	1102		H	MO	9	
18	"	11149			-	-		18	PMCKY	63101			-	-	
19	"	11212			EV	9		19	"	64209			-	-	
20	MC	11508	L	H	DW	6		20	NKP	25003	E	B	BR	-	
21		11513			-	-		21	WLE	30143	"	"	-	-	
22		11530			-	-		22	CBQ	72055	L	G	ELT	13	
23		12101			-	-		23	"	72129			-	-	
24		12113			-	-		24	"	72150			-	-	
25		12767			-	-		25	RDG	4562		F	-	-	
26	CP	139411	E	B	CP	16		26	BLE	65775		H	DW	6	
27	O&W	676		"	QS	-		27	SAL	36525			CY	13	
28	MDT	19495		R	-	-		28	SOV	107678			-	-	
29	NVC	431101	L	H	SV	6		29	DLW	81640			-	-	
30		431767			-	-		30	"	82291			-	-	
31		434567			-	-		31	"	85494			-	-	
32		432106			-	-		32	LV	16525			-	-	
33	PLE	66701			-	-		33	VTLX	22276	E	T	-	-	
34	"	66125			-	-		34	VSAX	25445	E	B	-	-	
35	C&O	29210			DW	-		35	"	25560			-	-	
36	T&P	5120	E	F	-	-		36	"	25638			-	-	
37	KCS	29104	L	H	-	-		37					-	-	
38	MKT	40686			-	-		38					-	-	
39	SLSF	87440			-	-		39					-	-	
40	"	88202			-	-		40					-	-	

1ST CUT-SWITCHED AT WEST END

2ND CUT-SWITCHED AT WEST END

2ND CUT-SWITCHED AT WEST END

4TH CUT-SWITCHED AT EAST END

3RD CUT-SWITCHED AT EAST END

Legend:

B - Boxcar      H - Hopper      R - Refrigerator  
T - Tank car    F - Flat            G - Gondola

Figure 6-8. Sample Format of a Track Check Converted to a Switch List

## ENGINE CREW

6-43. The engine crew consists of an engineer. The engineer works under the direction of the yard conductor. The engineer and conductor are both responsible for safe and efficient operation of the locomotive. The engine crew is also responsible for certain duties in switching operations. These duties include the following:

- Executing signals given by the ground crew.
- Interpreting hand signals and refusing any signals not clearly understood.
- Calling and repeating hand signals, switch-light colors, and signal-light aspects to each other to ensure signals are read properly.
- Answering the whistle signals of main-track trains with the appropriate whistle signals of the yard engine.
- Complying with timetable instructions in crossing main tracks.
- Questioning a signal when it may be unsafe to obey.
- Periodically inspecting and lubricating the locomotive's running gear.

## INSPECTORS

6-44. In military railroading, personnel of the car repair platoon of the railway equipment maintenance company are assigned to yards as inspectors. Car inspectors examine and make running repairs to cars entering a yard. Air inspectors test the air brake equipment of trains after they are built up and before their departure from the yard. All inspectors must be cautious when inspecting inbound cars. Chemical contamination may be present and unknown to the train crew. Suspicious liquid concentrations should be tested and all contaminated rolling stock marked using standard NATO NBC markers.

### Car Inspectors

6-45. One of the most important jobs in the movement of trains is that of the car inspectors. Car inspectors must check each car for over 200 possible defects. Inspectors are required to make close inspection of wheels and flanges, journals and bearings, underframes, brake rigging, handbrakes, air brake equipment, grab irons, sill steps, draft gear, and many other parts. If defects are not noticed and corrected, serious consequences may result. A defective car in a train could cause a derailment or a lengthy delay in setting the car off en route. Roof sheets, ladders, and running boards on closed-top cars must also be inspected. Experienced personnel can inspect a car in a short amount of time.

### **Air Inspectors**

6-46. Inspectors, although qualified in all phases of inspection, are frequently detailed to air inspecting and testing only. When a train is coupled, it is moved to a point where the air hose on the first car is over the hose connected to the ground air line. Inspectors couple air gauges between these hoses and walk the length of the train, coupling the hoses between cars as they progress. When all hoses are coupled and enough pressure is attained in the train line and reservoirs, brakes are applied on the train. Inspectors examine the piston travel to determine if enough braking force is being exerted on the wheels of each car. Linkage may need to be adjusted so that brake shoes will exert proper force. Every car is inspected for excessive air leakage and gauges are checked to determine the entire train line leakage. If leakage is within permissible limits, the train is reported to the yardmaster as ready for movement. The car inspectors will write a "shop" or bad-order tag for those defective cars that cannot be immediately repaired. These cars are cut out by the train yardmaster.

### **FREIGHT GROUPING AND CLASSIFICATION**

6-47. The governing principle throughout the grouping or blocking process is to group each cut of cars by destination so that its position in the outbound train requires a minimum of handling in setting it off. Classifying cars involves assigning them to a particular destination grouping and switching them to a track having the same grouping. When enough cars accumulate on the same track, either of one group or a combination of groups, an outbound train is ordered. Cars consisting of several groupings or blocks are set into the train in the order that they will be set off along the route. The first block to be set off is placed immediately behind the engine, followed by the next setoff grouping, and so on. Placing the blocks directly behind the locomotive involves the least amount of movement in setting them off. In special cases, there may be exceptions to this sequence. For example, a group of expedite cars may be carried next to the engine (a location out of their normal standing). This position would enable the yardmaster at the receiving terminal to remove them from the train before car inspectors blue-flag the track on which they arrive. The cars would then be placed on the head end of a departing train (again out of their normal standing) and handled identically at the next division terminal. The cars would be kept on the head end of all trains until they arrived at their destination. This method could save as much as 48 hours over an 800-kilometer haul. It might be equally convenient to have a setoff at either end of the train in a yard where the engine is to be changed.

## BILL RACK

6-48. A bill rack is another method of keeping track of waybills. However, it should never take precedence over the entries in the journal. The rack always contains a separate section for every track that the yardmaster has jurisdiction over. Waybills are put in the sections in the exact order that cars enter and stand on the tracks. When a crew switches loaded cars in the yard, the yardmaster switches the waybills to the appropriate slots in the bill rack (Figure 6-9). In a westbound yard, when cars are switched to the west end of a track, the bills are usually placed in front of those already in the particular track slot. When cars are switched to the east end, bills are placed behind those already in the rack. Do not assume that because a slot is empty, the track is clear—too many people use it. Careful switching of bills is as important as switching of the cars. When bills are correctly switched, one may see that the exact standing of a track makes it a simple matter to estimate or compute the tonnage of any track when planning an outbound movement. The journal, never the bill rack, is the authority for determining the clear tracks. A particular slot in the bill rack may be empty but a mistake may have been made in switching the bills.

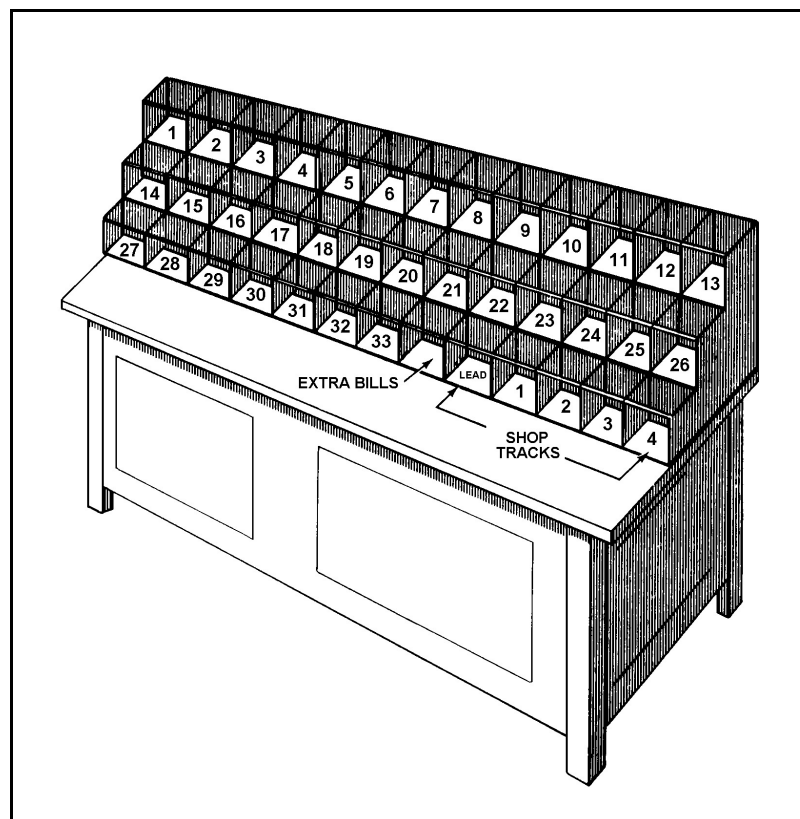


Figure 6-9. Bill Rack